Advantages of a Process Manufacturing ERP Application over a Discrete Manufacturing ERP application

Introduction

Trying to understand the differences between an ERP application built for process manufacturers vs one built for discrete manufacturing?

This guide highlights several key software capabilities found in BatchMaster ERP that support the unique requirements of process manufacturers - right out of the box.

With an architecture built from the ground up for process manufacturers, companies running BatchMaster ERP avoid the costly modifications, unnecessary workarounds and risks that come with running a discrete manufacturing ERP application in a process manufacturing environment.

Specifications

In discrete manufacturing, a multi-level bill of material architecture (BOM) is employed to produce one finished product in its base unit of measure. In process manufacturing, a formula is employed to produce a product, including by-products and co-products, in a weight and volume units of measure, which is then packaged in multiple configurations, using a multi-level bill of material architecture (BOM).

Managing separate formula and packaging specifications in BatchMaster ERP has it benefits, such as
- Allowing one or more developers and package designers to work on their own respective specifications.
- Reducing specification proliferation by linking formulas with packaging configurations to create complete finished good specifications.
- Ensuring standardization of a common formula or packaging configuration.
- Avoiding specification maintenance every time there are packaging changes since formula is a separate record.

Formulation

Formulation and Laboratory modules found in BatchMaster ERP accelerate the product development process by allowing users to:
- Define co-products and by-products within a formula
- Estimate co-product and by-product yields and costs upfront
- Auto adjust an ingredient's required weight or volume based upon its variable characteristic (e.g. potency)
- Define ingredient units of measure quantities down to 8 decimal points.
- Define ingredient property values based upon user defined or industry available information (e.g. USDA, Genesis databases)
- Calculate a formula's property values based upon user defined and industry standard formulas, which comes in a prebuilt library.
- Define expected losses and gains during production, which auto adjusts ingredient weights or volumes
- Define ingredient weights and volumes in terms of both numeric values and percentages.
- Dynamically adjust ingredient quantities to meet a formula's target property values, allowing developers to analyze "what if" scenarios, for example, using alternate ingredients or different ingredient ratios.

Scheduling

Separate formula and packaging specifications allow BatchMaster ERP scheduling module to consolidate demand for multiple finished goods with the same base formula in order to schedule a large "make" batch job (formula) that feeds multiple "fill" batch jobs (packaging BOM's). For example, make a common dough to be used in a number of bakery items or a base paint to produce a number of colored paints.

BatchMaster ERP can schedule batch jobs on a production line based upon the products' variable characteristics which can minimize the number of changeovers, improving overall resource utilization and lowering product costs. For example, a vanilla ice cream followed by a chocolate ice cream with nuts, versus the reverse.

Production

To effectively manage the variable characteristics of on hand inventory, BatchMaster ERP can allocate various inventory lots of varying characteristics in order to meet a batch job's finished goods target property value. For example, produce a finished good with strength of 70% using active ingredients that are available in inventory lot strengths of 50% and 90%.

Scaling production in process manufacturing is different than in discrete manufacturing. Take for example a chemical reaction within 10 liters of a solution (e.g. the minimum level) that takes the same time as 50 liters (e.g. the maximum level) of the same solution in the same vessel. Linear scaling function used in discrete manufacturing doesn't work in process manufacturing, therefore a "step" approach must be employed.

On hand inventory of the same item may have different variable characteristics per lot number. One lot may be acceptable in one customer formula, but not in another, because the produced finished goods may not meet the customer requirements. Examples include specific meat grade for designated retail customers or a country of origin requirement for specified customers. With full visibility into available raw material inventory and their product characteristics, BatchMaster ERP enables manufacturers to promise and produce finished goods that meet their customers' requirements.

Costing

BatchMaster ERP can estimate upfront, capture and compare estimated and actual costs for all finished products, including intermediates, by-products and co-products. Finished good costs are calculated from labor costs (both static and dynamic, based upon the product yields), consumable material costs and ingredient / raw material costs, all defined within the formula and packaging specifications.

Inventory

Visibility to inventory in terms of its units, weights and volume, along with their variable attributes - all at the same time – is key to process manufacturers. In addition to standard measurements conversions (e.g. US to metric), user-defined and automatic UOM conversions (e.g. liquids to solids, gases to liquids) are available in BatchMaster ERP.

To support the various types of items consumed and produced in process manufacturing, BatchMaster ERP supports an unlimited number of product characteristics. In addition to these user defined product characteristics, the application comes preloaded with a number of industry standard characteristics, such as pH, potency and carbohydrates, as well as calculated values, such as VOC and specific gravity.

Tracking expiration dates is a daily concern for process manufacturers, especially for food processors. BatchMaster ERP's inventory allocation function recognizes LIFO (last in first out), FIFO (first in, first out), and FEFO (first to expire, first out), as well as taking into consideration the number days of shelf life required by a customer.

Quality

BatchMaster ERP is delivered with a library of industry specific QC tests and special instructions that applied against received raw materials, WIP products and inventory in storage (e.g. stability tests). Since there's a high level of variability associated to an inventory's condition, BatchMaster ERP supports an unlimited number of user defined quality statuses that can be applied to raw materials, intermediates and finished goods in the receiving, production and order fulfilment processes, as well as to inventory in storage based upon the results of QC tests.

Reworking a batch job that has failed inspection involves one or more cycles of adding ingredient quantities or new ingredients in WIP, until the reworked product passes inspection. BatchMaster ERP controls the rework processes and captures all variances and inspection results.

Batch job reworks are just one situation where the user may initiate a series of deviation, nonconformance and CAPA processes that are built into BatchMaster ERP. An audit history is maintained for regulatory reporting purposes, which is an FDA requirement for pharmaceutical manufacturers.

Regulatory Compliance

BatchMaster ERP generates a variety of industry specific documents and audit reports, including but not limited to FDA nutritional fact panels, nutraceutical supplemental panels, pharmaceutical electronic batch records, and chemical SDS reports and labels.

Lot Traceability

Lot inheritance is a critical ERP function that is responsible for tracking and tracing the lineage of all raw materials and finished products, including co-products and by-products.

Lot traceability in many ERP applications is limited to a "one up and one down" snapshot, meaning information on a product is generated for its current state, one step before its current state and one step after its current state. BatchMaster ERP is optimized for bi-directional lot traceability of raw materials, intermediates and finished goods, including by-products and co-products. Pharmacutical epedigree and GHSI food safety initiatives rely on the accurate reporting of lot traceability information in minutes, not hours or days.

Ingredients present in minuscule amounts in a finished good can be tracked and traced using BatchMaster ERP, which is a critical requirement for chemical and pharmaceutical manufacturers.

Summary

Process manufacturers should focus on those ERP applications with a strong process manufacturing foundation that can support one's unique requirements with minimum customization. From managing the variability of products and processes to accurately accounting for all raw materials and finished goods, running the right ERP application will provide granular visibility to manufacturing data and effectively streamline all of one's business processes.

About BatchMaster Software

BatchMaster Software ERP solutions enable process manufacturers to streamline their operations and scale production, while reducing costs and complying with customer demands and ever more stringent regulatory mandates.

For more information, please visit www.batchmaster.com or email your inquiry to sales@batchmaster.com